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EXAMINER

RICHEY, SCOTT M

ART UNIT	PAPER NUMBER
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2891

DATE MAILED: 11/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/524,596

Applicant(s)

ANDERTON ET AL.

Examiner

Scott M. Richey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 07/05/2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 9, 11-15, 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Hugenin (US Patent No 5,047,783).

3. Hugenin discloses a millimeter-wavelength detection device comprising:
(Claim 1) at least one dielectric lens element (col.4, ln.54; Figure 1(105)),
a receive element which is sensitive to millimeter-wavelength radiation
(Abstract; col.4, ln.59; col.12, ln.32-34; Figure 1(106)),

wherein the optical system focuses incident radiation onto the receive element (col.4, ln.54-64),

wherein the device is able to measure power of a signal at different times (col.8, ln.28-31; Figure 5) and further adapted to measure different parts of the scene (col.2, ln.49-57) and to provide an indication based on the measurements (high quality images from the field of view, Abstract; images are displayed on a video system, col.3, ln.20),

(Claim 2) wherein the device is able to measure radiation at a plurality of polarizations from the scene (3, ln.45-48),

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(Claim 3) further comprising a means for altering the polarization of the incident radiation (col.6, ln.28-31, 53-59),

(Claim 4) wherein the means for altering the polarizations periodically alters the polarization of radiation orthogonal to the first polarization state such that it is in the first polarization state (col.6, ln.53-59),

(Claim 9) wherein a millimeter-wavelength source is arranged to periodically provide a reference signal to the receive element (local oscillator, col.5, ln.16; Figure 1(114)),

(Claim 11) wherein the direction of incoming radiation changes with time (col.8, ln.51 - col.9, ln.6; Figure 1(107)),

(Claim 12) wherein the device makes successive measurements at orthogonal polarizations (col.3, ln.45-48),

(Claim 13) wherein the device makes successive measurements in a particular direction at orthogonal polarizations (where the particular direction is the direction the detector is pointing, col.3, ln.45-48),

(Claim 14) wherein the refractive element is mounted, as to be rotatable, in the path of the incident radiation so that different rotational positions result in radiation from differing directions being passed to the receive element (col.8, ln.44 - col.9, ln.6; Figure 1(107)),

(Claim 15) wherein the refractive element comprises a prism (col.8, 55,56), and

(Claim 21) wherein the optical system comprises an afocal telescope (col.4, ln.57-60).

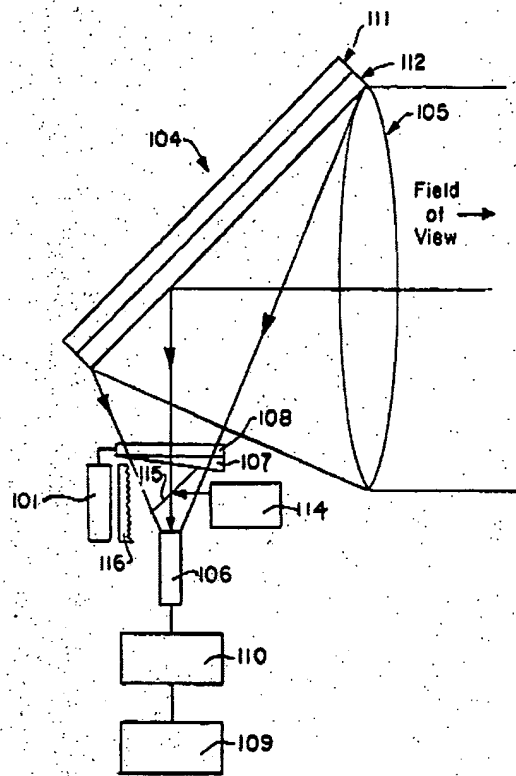


FIG. 1

4. Claims 22-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Chalfin (US Patent No 3,784,899).

5. Chalfin discloses a method of detecting objects present in a scene by means of receiving millimeter-wavelength radiation from a scene, characterized in that:

(Claim 22) a first measurement is made of radiation from a first part of the scene (col.6, ln.30,31; Figure 6),

a second measurement is made of radiation from a second part of the scene (col.6, ln.31-33; Figure 6),

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an indication is provided if characteristics of the first measurement are different to the characteristics of the second measurement (col.6, ln.42),

(Claim 23) wherein an observed characteristic is the received power level (power is the first time derivative of energy which, for an ideal gas, i.e. photons, is linear with temperature, col.6, ln.35-39), and

(Claim 24) wherein the two measurements are of orthogonally polarized radiation (horizontal polarization and vertical polarization, col.6, ln.30-33).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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8. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hugenin (US Patent No 5,047,783) as applied to claim 4 above in view of Budil et al. (US Patent No 6,101,015).

9. Hugenin substantially teaches the basic claimed apparatus of claim 4, discussed above.

10. Hugenin does not teach a fixed quarter-wave plate or a moveable quarter-wave plate which determines the polarization of radiation incident on the receive element, wherein the quarter-wave plates are fitted with polarizing elements, wherein the moveable quarter-wave plate is rotatably mounted and permit transmission of incident radiation such that the radiation sees the fast axes in multiple positions.

11. Budil et al. teach a detector comprising:

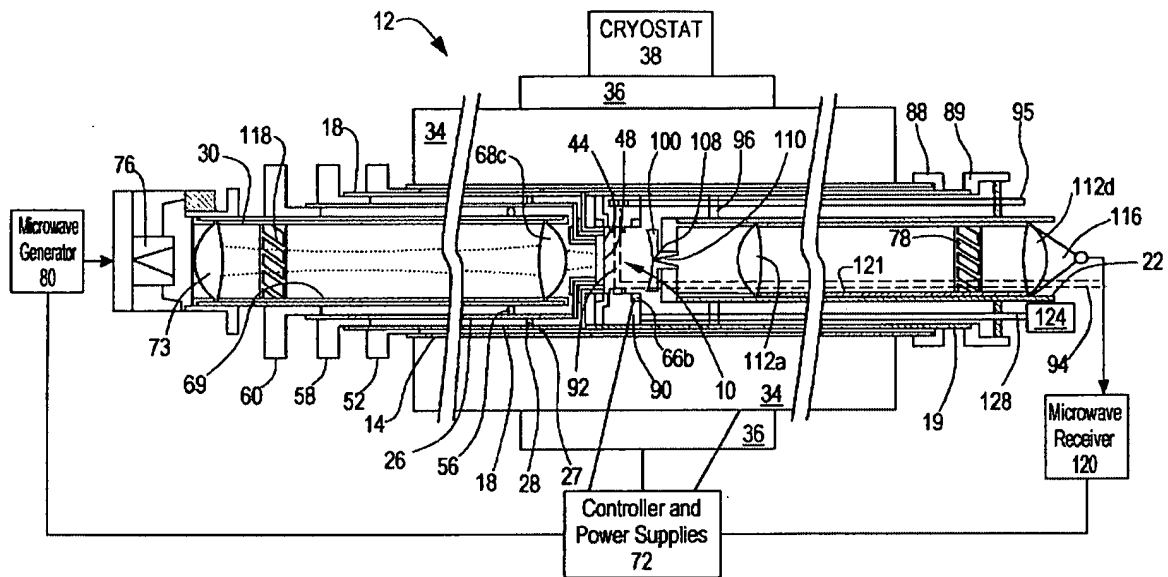
(Claim 5) a fixed quarter-wave plate and a moveable quarter-wave plate which determines the polarization of radiation incident on the receive element (col.7, ln.35-39; Figure 1A (118) and (78); col.11, ln.14-18; Figure 7 (220) and (280); Figure 8 (320) and (380)),

(Claim 6) wherein the quarter-wave plates are fitted with polarizing elements (Col.10, ln.26-29),

(Claim 7) wherein the moveable quarter-wave plate is rotatably mounted (The tube containing the quarter-wave plate (118) is fixed in orientation w.r.t. the incident radiation, while the tube containing the quarter-wave plate (78) is free to rotate. col.7, ln.46-53) and permits transmission of incident radiation such that the radiation sees the fast axes in multiple positions (A quarter-wave plate with a

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fast axis, i.e. made of a birefringent medium, must allow the incident radiation to see the fast axis for any $\frac{1}{2} \pi$ rotation.) for the benefit of increased signal power received at the receive element (col.7, ln.40-45).



12. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include quarter-wave plates and polarizers in the apparatus of Hugenin in view of Budil et al. because, as disclosed by Budil, to do so "can lead to a four-fold increase in signal power."

13. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hugenin (US Patent No 5,047,783) in view of Budil et al. (US Patent No 6,101,015) as applied to claim 5 above, and further in view of Epis (US Patent No 3,754,271).

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14. Epis teaches a receiver wherein the quarter-wave plates are meanderline structures (Abstract) for the benefit of a low-frequency operating limit.

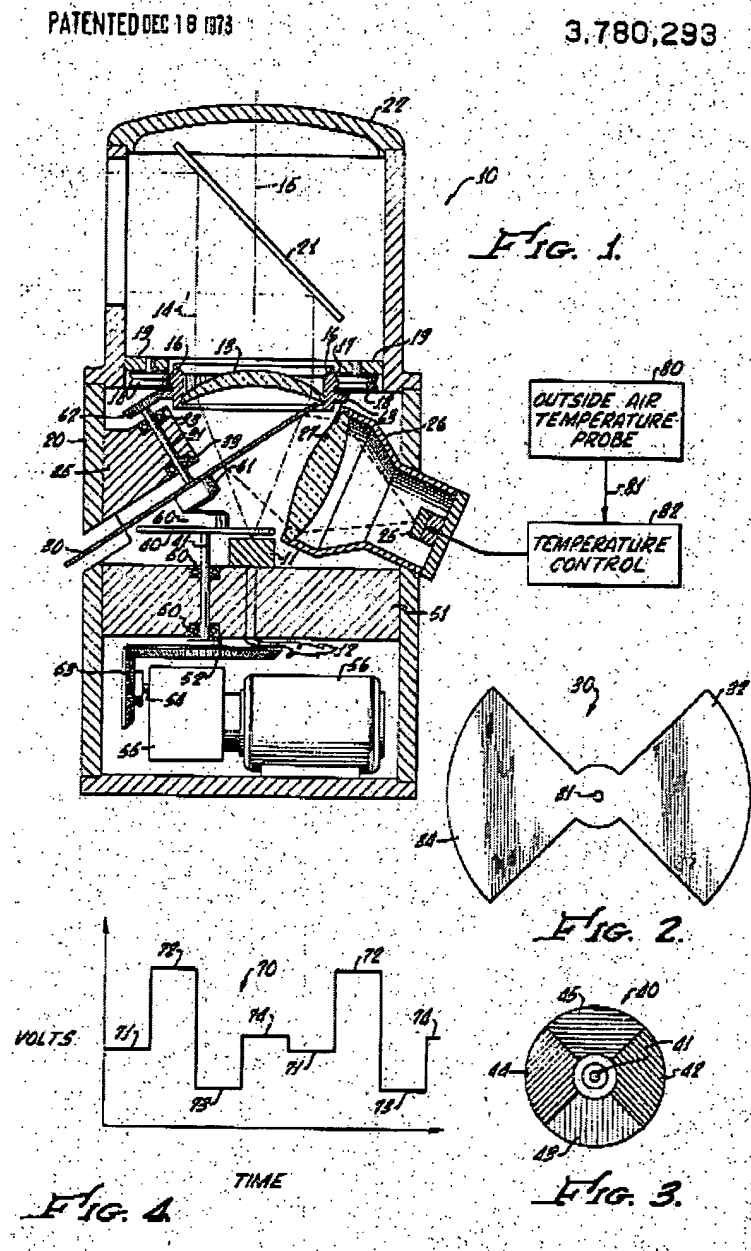
15. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include meanderline quarter-wave plates in the apparatus of Hugenin and Budil et al. because, as disclosed by Epis: "An advantageous and inherent characteristic of the meanderline array polarizer as compared to other prior art polarizers is that the former has no intrinsic or theoretical low-frequency operating limit" (col.1, ln.56-59).

16. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hugenin (US Patent No 5,047,783) as applied to claim 9 above in view of Flint (US Patent No 3,780,293).

17. Hugenin substantially teaches the basic claimed apparatus of claim 9, discussed above.

18. Hugenin does not teach an apparatus wherein the internal light source comprises a light chopper to periodically interrupt the path of the radiation received by the optical system.

19. Flint teaches an apparatus wherein the source comprises a light chopper to periodically interrupt the path of the radiation received by the optical system (Abstract; Figure 1 (30); Figure 2) for the benefit of detecting changes in time of incident radiation.



20. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the chopper in view of Flint with the internal source of Hugenin because the chopper can aid the ability to detect changes in time of the incident radiation.

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21. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hugenin (US Patent No 5,047,783) in view of McLeod ("The Axicon: A New Type of Optical Element," Journal of the Optical Society of America, August 1954, pp.592-597).

22. Hugenin substantially teaches the apparatus of claim 14 above.

23. Hugenin does not teach an apparatus wherein the refractive element comprises a conic segment.

24. McLeod teaches the use of a conic segment for the benefit of corrected spherical aberration and no chromatic aberration (p.595, ¶4).

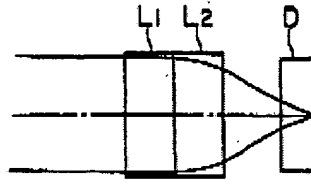
25. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a cone in place of the prism or lens of Hugenin in view of McLeod because a cone corrects for spherical aberration and has no chromatic aberration.

26. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hugenin (US Patent No 5,047,783) as applied to claim 14 above in view of Aono (US Patent No 4,639,094).

27. Hugenin substantially teaches the apparatus of claim 14 above.

28. Hugenin does not teach an apparatus wherein the refractive element comprises a parallel-faced slab.

29. Aono teaches a refractive element comprising a parallel-faced slab (gradient index (GRIN) lens, col.9, ln.48) for the benefit of correcting for spherical aberration, coma, and curvature of field (col.1, ln.38-46).

FIG. 3A

30. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a parallel-faced slab, or GRIN lens, in place of the prism of Hugenin in view of Aono because a GRIN lens can correct for spherical aberration, coma, and curvature of field.

31. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hugenin (US Patent No 5,047,783) as applied to claim 1 in view of Bierleutgeb et al. (US Patent No 4,586,794).

32. Hugenin substantially teaches the apparatus of claim 1 above.

33. Hugenin does not teach an apparatus wherein the apparatus is arranged to change the beam width of a receive beam with time, the beam width is changed by means for changing the focal length of the lens elements, or wherein the means for changing the focal length of the lens elements comprises an apparatus for switching different lenses into the path of the received radiation.

34. Bierleutgeb et al. teach a detector comprising:

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35. (Claim 18) an arrangement to change the beam width of the receive beam in time (col.3, ln.3-8; col.3, ln.52-63),

36. (Claim 19) wherein the beam width is changed by means for changing the focal length of the lens elements (col.3, ln.15-21), and

37. (Claim 20) wherein the means for changing the focal length of the lens elements comprises an apparatus for switching different lenses into the path of the received radiation (col.3, ln.15-21) for the benefit of "trouble-free changing between a low-magnification [...] objective and a low-magnification [...] objective" (col.3, ln.19-21).

38. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the lens system with the detector of Hugenin in view of Bierleutgeb et al. for the benefit of "trouble-free changing between a low-magnification [...] objective and a low-magnification [...] objective."

39. Claims 25, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chalfin (US Patent No 3,784,899) as applied to claim 22 above in view of Shrekenhamer et al. (US Patent No 5,942,899).

40. Chalfin substantially teaches the basic claimed method of claim 22, discussed above.

Chalfin does not teach the method wherein the incoming radiation is focused onto a receive element by means of an optical system wherein the optical system incorporates scanning means to change with time the direction of

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arrival of the incoming radiation such that measurements from different parts of the scene are taken.

41. Shrekenhamer et al. teaches a method:

(Claim 25) wherein the incoming radiation is focused onto a receive element by means of an optical system (col.9, ln.45; Luneberg lenses, col.9, ln.49) for the benefit of extending the available aperture (col.9, ln.52),

(Claim 26) wherein the optical system incorporates scanning means to change with time the direction of arrival of the incoming radiation such that measurements from different parts of the scene are taken (col.9, ln.61-67; Figure 7; Figure 8) for the benefit of improved sensitivity.

42. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the optical system in view of Shrekenhamer et al. in the method of Chalfin because, as disclosed by Shrekenhamer et al. "Lens antennas have added value in this application, where beamfill factor is governed by the available aperture extent," and the changing the direction of incidence to view different parts of the scene can improve sensitivity.

43. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chalfin (US Patent No 3,784,899) in view of Shrekenhamer et al. (US Patent No 5,942,899) as applied to claim 25 above, and further in view of Hugenin (US Patent No 5,047,783).

44. Chalfin and Shrekenhamer et al. substantially teach the basic claimed method of claim 25 discussed above.

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45. Chalfin and Shrekenhamer et al. do not teach a method wherein the receive element is sensitive to the polarization of the incident radiation or wherein a means is incorporated for altering the polarization of the incident radiation.

46. Hugenin teaches a method of detecting objects wherein the receive element is sensitive to the polarization of the incoming radiation, and a means is incorporated for altering the polarization of the incoming radiation (col.3, ln.39-50) for the benefit of reducing background noise.

47. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the polarization-sensitive receive element and the means for altering the polarization of the incident radiation in the method of Chalfin and Shrekenhamer et al. in view of Hugenin because the combined method can reduce background radiation.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott M. Richey whose telephone number is (571) 274-1296. The examiner can normally be reached on Monday - Thursday, 8:00 - 17:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Ortiz can be reached on (571) 272-1206. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SMR


ANGELA ORTIZ
PRIMARY EXAMINER
SUPERVISOR

10/24/06